

I. APPLICANT'S CLAIMS DISTINGUISH BEHR

In the Office Action, Applicant's Claims 1-22 were rejected under 35 U.S.C. § 103 as obvious over U.S. Pat. No. 5,808,566 (Behr). Applicant respectfully traverses this rejection. For the reasons explained below, Applicant's Claims 1-22 are not obvious over Behr.

A. Brief summary of subject matter of present application

The present application relates to (1) an improved way to organize a geographic database, (2) a method for forming the improved geographic database and (3) a method and program for using the improved geographic database.

The improved geographic database includes data that are organized spatially. More particularly, the data in the geographic database are organized into a plurality of groupings (or "parcels"). Each parcel of data contains data records that represent the geographic features that are located within a separate corresponding area of the entire geographic region represented by the entire geographic database. Associated with each of the plurality of parcels is a first index and a second index. The first index defines a plurality of sub-areas formed of the area represented by the data in the parcel with. The second index associates each of the data in the parcel with at least one of the sub-areas.

The present application also discloses a method for producing a geographic database that is organized into a plurality of parcels each of which includes first and second indexes, as described above.

The present application also discloses a program and method that use a geographic database that is organized in the improved way. The program and method use the first and second indexes to identify which data in a parcel satisfy a spatial search criterion. The program can be part of a navigation system and the method can be performed by the navigation system.

B. Brief summary of the Behr patent

The Behr patent (U.S. Pat. No. 5,808,566) relates to a method and system for providing navigation features to users. The method and system include remote units that communicate with a base unit. The remote units may be in-vehicle navigation systems

that are installed in vehicles that travel along roads in a geographic area. The in-vehicle navigation systems use data contained in geographic databases that are installed in the respective vehicles. The base unit may be a centrally located server that also uses a geographic database. According to one embodiment, when a remote unit provides a navigation-related function to a user, the remote unit determines what data in addition to the data already stored locally with the remote unit are required to provide the navigation-related function. The remote unit then requests these additional data from the base unit. The base unit then accesses its own database to obtain the requested additional data and transmits the additional data to the remote unit. The remote unit then provides the navigation-related function to the user using both data from the geographic database installed locally in the remote unit and data obtained from the base unit. Thus, according to one disclosed embodiment, when navigation-related functions are provided to a user of the remote unit, a portion of the data required to provide the navigation-related function is obtained locally (i.e., on-board the remote unit) and another portion of the data is obtained from the base unit.

(The Behr patent is assigned to the owner of the present application.)

C. Applicant's Claims 1-22 are not obvious over Behr.

MPEP 2143 sets forth the requirements for establishing a case of obviousness.

MPEP 2143 lists the following three criteria:

- (1) there must be a suggestion or motivation to modify the reference or to combine reference teachings;
- (2) there must be a reasonable expectation of success; and
- (3) the prior art reference or references must teach or suggest all the claimed elements.

Applicant's Claims 1-22 are not obvious over the Behr reference at least for the reason that the criterion (3), above, is not met, i.e., with respect to each claim, the prior art reference (i.e., Behr) does not teach or suggest all the elements the claim. As explained below, each of Applicant's claims includes at least one feature that is neither disclosed in nor suggested by the Behr reference.

Applicant's independent Claim 1

Applicant's independent Claim 1 relates to a method for producing a database.

Applicant's independent Claim 1 includes the steps of:

- (1) *"spatially parcelizing" a plurality of data entities into a plurality of parcels*,
- (2) *"determining a plurality of sub-areas"*, and
- (3) *"storing a first index" that identifies with respect to each of the data entities contained in the parcel "each of said sub-areas intersected by the geographic feature represented thereby."*

The Behr reference includes *none* of these steps of Applicant's Claim 1.

Moreover, the Office Action identified no motivation to modify the Behr reference to include any of these steps.

As mentioned above, the Behr reference relates to a system whereby geographic data are transmitted from a base unit to remote units to provide navigation features. Behr does not disclose a particular format for the arrangement or organization of the data in the databases used to provide navigation features to the remote units. Behr does not disclose that the data are organized spatially or that the data are organized into parcels.

Even assuming *arguendo* that the Behr reference does disclose a form of spatial organization, Behr does not disclose the type of index described in Applicant's Claim 1. Specifically, Behr does not disclose *"storing a first index"* that identifies with respect to each of the data entities contained in a parcel, each *"sub-area"* intersected by the geographic feature represented thereby.

At least for any of these reasons, Applicant's independent Claim 1 is not obvious over the Behr patent.

Applicant's independent Claim 11

Applicant's independent Claim 11 relates to a method of using a navigable map database with a navigation system. Applicant's independent Claim 11 includes the steps of :

- (1) *"identifying a search area"* in a geographic region,
- (2) *"identifying at least one parcel of data in the navigable map database"* that contains data entities that represent features encompassed within a first rectangular area that *"intersects said search area"*,
- (3) *"using a first index"* associated with the parcel of data *"to identify each of a plurality of sub-rectangles of said first rectangular area that intersect said search area"*, and
- (4) *"using a second index"* associated with the parcel of data *"to identify"* which data entities contained in the parcel intersect each of the sub-rectangles identified by using the *"first index."*

The Behr reference discloses or suggests *none* of the steps of Applicant's Claim 11.

Behr does not disclose how data are accessed in a database to find particular data entities that represent features contained within a defined geographic search area. In particular, Behr does not disclose the steps of *"using"* the particular types of indexes described in Applicant's Claim 11. As an example, Behr does not disclose the steps of *"identifying at least one parcel"*, *"using a first index"*, and *"using a second index."*

For at least any of these reasons, Applicant's independent Claim 11 is not obvious over the Behr patent.

Applicant's independent Claim 12

Applicant's independent Claim 12 relates to a method of using a navigable map database with a navigation system. Applicant's independent Claim 12 includes the steps of:

- (1) *"identifying a search area",*
- (2) *"identifying" the parcels that contain the data entities that represent the features that are encompassed by a rectangular area that intersects the "search area",*
- (3) *"using a first index" associated with each of said parcels "to identify each sub-rectangle" of a "plurality of sub-rectangles" that intersects the "search area", wherein the "plurality of sub-rectangles" are "sub-rectangles" of the "rectangular area that encompasses the features represented by the data entities of the parcel", and*
- (4) *"using a second index" associated with the parcel "to identify" each of the data entities that "intersects each sub-rectangle" of the "plurality of sub-rectangles identified by using the first index associated with the parcel."*

The Behr reference does not disclose or suggest the step of *"identifying" the parcels "using a first index" or "using a second index."* There are various types of indexes and the Behr reference does not disclose indexes of the type recited in Applicant's Claim 12. At least for these reasons, Applicant's independent Claim 12 is not obvious over the Behr patent.

Applicant's independent Claim 16

Applicant's independent Claim 16 relates to a map database for use in a navigation system. Applicant's independent Claim 16 recites that the map database includes a plurality of data records each of which represents a physical geographic feature in a geographic region. Applicant's Claim 16 further recites that the data records are spatially parcelized (i.e., "organized") into a plurality of parcels each of which includes a separate portion of the data records such that the portion of data records in

each parcel represents those geographic features encompassed together in a separate area of the geographic region.

Applicant's Claim 16 further recites that the map database includes an improvement such that each of the "*parcels*" is associated with an "*index table*" (i.e., an "*index table of a first type*"). The "*index table*" of Applicant's Claim 16 includes:

- (1) a "*reference*" to each data record in the "*parcel*" to which said "*index table*" is associated; and
- (2) a "*reference*" to at least one of a plurality of "*spatially organized*" groupings of the plurality of data records within the "*parcel*."

The Behr reference does not disclose a map database having the type of organization recited in Applicant's Claim 16. As an example, Behr does not disclose that the databases used to provide the navigation features to the remote units is "*spatially organized*." Moreover, even assuming *arguendo* that the Behr reference discloses a "*spatially organized*" database, Behr does not disclose that "*parcels*" of the database are each associated with an "*index table*" that references the "*data records*" in the "*parcel*" with a plurality of "*spatially organized*" groupings of the plurality of data records within the "*parcel*."

At least for any of these reasons, Applicant's independent Claim 16 is not obvious over the Behr patent.

Applicant's independent Claim 18

Applicant's independent Claim 18 relates to a geographic database stored on a computer-readable medium for use in a navigation application program. Applicant's independent Claim 18 recites that the geographic database includes a plurality of data entities each of which represents a physical geographic feature in a geographic region. Applicant's Claim 18 further recites that the data entities are spatially parcelized (i.e., organized) into a plurality of "*parcels*" each of which includes a separate subset of the data entities such that the subset of data entities in each "*parcel*" represents those geographic features encompassed together in a separate rectangular area of the geographic region.

Applicant's Claim 18 further recites that each of the "*parcels*" is associated with an "*index*" that relates each of the data entities in the "*parcel*" with one of a plurality of groupings of the data entities associated with the "*parcel*."

The Behr reference does not disclose a geographic database that has the type of organization described by Applicant's Claim 18. As mentioned above, Behr does not disclose that the databases used to provide the navigation features to the remote units is "*spatially organized*" and further Behr does not disclose that an "*index*" associated with each of the "*parcels*" that relates the "*data records*" in the "*parcel*" and one of a plurality of groupings of the data entities in the "*parcel*."

At least for any of these reasons, Applicant's independent Claim 18 is not obvious over the Behr patent.

Applicant's independent Claim 22

Applicant's independent Claim 22 relates to a computer usable medium having computer readable program "*data structure means*" embodied therein for use in a map database. The map database of Applicant's Claim 22 includes "*data records*" that represent "*segments of roads*" in a geographic region. The "*data structure means*" provides for identifying which "*data records*" in a plurality of spatially organized "*parcels*" of data meets a spatial search criterion. The "*data structure*" recited in Applicant's Claim 22 includes:

- (1) "*first indices*" each of which is associated with a respective one of the "*parcels*", wherein each "*first index*" determines a plurality of sub-areas formed of an area associated with a respective parcel; and
- (2) "*second indices*" each of which is associated with a respective one of the "*parcels*", wherein each "*second index*" associates a "*data record*" in its respective "*parcel*" to at least one of the plurality of sub-areas determined by the one of the plurality of "*first indices*" associated with the respective "*parcel*."

The Behr reference does not disclose a map database having the type of elements recited in Applicant's independent Claim 22. As an example, Behr does not disclose a "*data structure means*" comprising (1) "*first indices*" each of which determines a

plurality of sub-areas formed of an area that encompasses the geographic features represented by the data records in a respective associated "*parcel*" and (2) "*second indices*" each of which associates a "*data record*" in a respective "*parcel*" to at least one of the plurality of sub-areas determined by the "*first index*" associated with the respective "*parcel*."

At least for any of these reasons, Applicant's independent Claim 22 is not obvious over the Behr patent.

Applicant's dependent claims 2-10, 13-15, 17 and 19-21.

Applicant's dependent Claims 2-10, 13-15, 17 and 19-21 were rejected as obvious over Behr. Each of these dependent claims is not obvious over Behr at least for the reasons explained above in connection their respective base claims. In addition, each of these dependent claims includes features that are neither disclosed in nor suggested by Behr. As an example, Applicant's dependent Claim 2 recites that the "*first index*" is a "*bit map*." This feature is not disclosed or suggested by Behr. Likewise, Applicant's dependent Claim 4 recites that the "*first index*" is stored "*internally*" of each of the parcels. Since Behr does not disclose geographic databases that are organized into parcels, it cannot disclose or suggest a "*first index*" that is stored "*internally*" of each of the parcels. Similarly, the other dependent claims include features that are not disclosed or suggested by Behr.

II. PREVIOUS SUBMISSION OF NEW POWER AND CHANGE OF CORRESPONDENCE ADDRESS.

On December 3, 1998, Applicant submitted a new Power of Attorney in the present application. The new Power of Attorney included a change of correspondence address. However, the Office Action dated July 6, 2000 was sent to the previous correspondence address. Accordingly, a copy of the Power of Attorney that had been previously submitted on December 3, 1998 is included with this response. Applicant requests that the Power of Attorney dated December 3, 1998 be made of record in the present application if it has not been made of record already. Applicant also requests that the change of correspondence address be made of record in the present application. To assist the Examiner, a new change of correspondence form is included herewith.

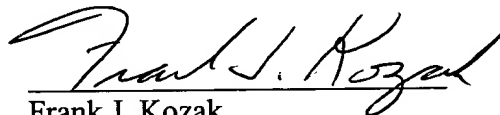
III. CLAIM AMENDMENTS

With this response, Claims 1 and 12 are amended. These amendments are intended to clarify these claims and improve their grammatical construction.

IV. CONCLUSION

With this response, all the issues in the Office Action mailed July 6, 2000 have been addressed. The present application has been placed in condition for allowance. If any issues remain, the Examiner is invited to call the undersigned at the telephone number indicated below.

Respectfully submitted,



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